SECTION 34 11 33

WOOD TIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. This Section includes specifications for wood crossties and wood ties for special trackwork.

1.02 MEASUREMENT AND PAYMENT

A. Wood ties will not be measured separately for payment. All costs in connection therewith will be considered as included in the applicable Contract lump sum price or the Contract unit price per linear foot for trackwork of the different types indicated in the Bid Schedule of the Bid Form.

1.03 REFERNCE STANDARDS

A. American Railway Engineering and Maintenance of Way Association (AREMA): Except for modifications, amplifications, deletions, and additions indicated herein, as follows:

1. Volume 1, Chapter 3, Ties and Wood Preservation.

2. Volume 2, Chapter 7, Timber Structures.

B. American Wood Preservers Association (AWPA):

1. AWPA P1 Standards for Coal Tar Creosote for Land and Freshwater Marine (Coastal Water Use).

2. AWPA P3 Standards for Creosote-Petroleum Oil Solution.

3. AWPA C6 Cross Ties and Switch Ties Preservative Treatment by Pressure Processes.

1.04 SUBMITTALS

A. General: Refer to Section 01 33 00, Submittal Procedures, and Section 01 33 23, Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.

B. Submittal Schedule:

Reference Item	Title	Article	Time Required
1.	Certificate of Conformance	2.02.B	Prior to Shipment
2.	Timber Treatment Report	2.02.B	Prior to Treatment
3.	Certificate of Compliance of Tie Pad	2.02.B	Prior to Shipment
4.	Wood Preservation Application	2.02.B	Prior to Application

1.05 QUALITY ASSURANCE

A. The cross-section of timber ties shall be plus or minus one fourth inch.

B. Ties shall be free of wayne.

C. Length shall be plus two inches or minus zero inches.

D. Wood shall be of compact wood throughout the tie, where any inch of any radius from the pith shall have six or more rings of annual growth.

E. Ties with large knot or numerous knots shall not be accepted. A large knot is one in which its average diameter exceeds one fourth of the surface on which it appears. Such a knot may be allowed if it occurs outside the tie plate area. Numerous knots are any number equaling one half of a large knot in damage effect.

F. The surface of a tie will be considered acceptably straight if:

1. When along the top and bottom surfaces, a string line stretched from mid-width at one end of the tie to mid-width at the either end of the tie within plus or minus one eighth inches of being truly straight, and;

2. When along each side a string line stretched from mid-depth of one end of the tie to the mid-depth of the other end of the tie is one eighth inches of being truly straight.

G. Ties shall be rejected if its surfaces are cut with score marks more than one eighth inch in depth or when its surfaces are uneven.

H. The top and bottom surfaces or opposite sides of a tie will not be considered parallel if any difference in tie thickness measured along the depth or along the sides exceeds one fourth inch, and shall be rejected.

I. Ties shall be free of bark seams.

J. Ties shall be free of twist in excess of one fourth inch per 10 feet in length.

PART 2 – PRODUCTS

2.01 DISTRICT-FURNISHED MATERIALS

A. Refer to Section 01 64 13, District-Furnished Materials and Equipment, of the Contract Specifications for description and quantity of District-furnished materials.

2.02 CONTRACTOR-FURNISHED MATERIALS

A. Timber ties shall be manufactured from species identified as “Group Tb” in the AREMA manual and the follow requirements:

1. Size: Nine inches wide by seven inches deep
2. Lengths shall be provided as required in one foot increments.
3. The minimum cross tie length is 10 feet.
4. The minimum special Trackwork Tie length is 12 feet.

B. Timber Quality Grade Marks and Certificates: All ties shall be grade marked, and a certificate of conformance provided, to indicate conformance with ANSI/AITC A 190.1.

C. Preservative Treatment: Treat in accordance with the requirements of AITC 109 and the following requirements:

1. Treat in accordance with AWPA Standard C6 using Grade #1 Creosote or 50-50 creosote-petroleum solution, to a finial net retention of eight pounds per cubic foot.
2. The treatment provisions of AWPA Standard C6 shall be modified to require one half inch minimum and three fourths inch average penetration.
3. The Contractor shall provide complete inspection of preservative treatment process and materials by an experienced independent testing agency approved by the Engineer. Each accepted tie shall be grade-marked by the testing agency, and a report shall be prepared which includes a certificate of preservatives, an operating record of each charge, a record of retention and penetration, and a record of all ties rejected.

D. Wood Preservative: Provide an approved preservative formulated to treat holes drilled in timber ties. Submit manufacturer’s recommendations for application.

E. Tie Plate Anchor Assemblies: All rail plates, switch plates, frog plates, guard rail plates, and derail plates shall be anchored and insulated with the following components as indicated on the Contract Drawings:

1. Timber Screw Spikes: Seven eighth inch diameter galvanized washer head square screw spike designated for railway service.

2. Plain Washer: Seven eighth inch diameter Type B, regular, in accordance with ANSI B 18.22.1 Zinc-electroplated in accordance with ASTM B633. Type III, SC2.

3. Insulating Thimble: Press fit of a flat washer and sleeve fabricated of laminated thermoplastic conforming to NEMA LI-1, Grade G-10.

4. Tie Pad: One fourth inch thick polyethylene pads confirming to SATM D1248, Type III, Class C, Grade W8, for high density weather resistant polyethylene plastic with a durometer hardness of 60 to 65D. The hardness shall be stable between 140 degrees Fahrenheit and minus 40 degrees Fahrenheit. Submit a certificate of compliance.

PART 3 – EXECUTION

3.01 GENERAL

A. Install wood ties in accordance with the requirements of Section 34 05 17, Common Work Results for Trackway, Section 34 11 23 Special Trackwork, Section 34 11 27 Ballasted Track, except as modified herein.

B. Production of wood ties and fasteners components prior to the Engineer's review and approval shall be at the Contractor's sole risk and expense.

C. Manufacture using the same methods used to produce the qualification test pieces.

3.02 PRE-BORING

A. Drill nine sixteenth inch diameter pilot holes into timber ties for timber screw spikes to a depth limit of five inches, counter drill holes with seven eighth inch diameter hole for a depth of one inch, remove debris from holes, and fill holes with wood preservative. Pre-boring shall be perpendicular to the tie and centered in the tie plate hole. Only rail mounted rail tie boring machine specifically designed for this specific task shall be used, and shall include a centering nipple. Plates shall be clipped to the rail prior to drilling.

3.03 PLATE INSTALLATION

A. Place a tie pad under each steel plate, center plate on tie and clip plate to the rail. Position the palate with the field side shoulder parallel to and in uniform contact with the rail base. Plates shall be positioned for a minimum of 10 ties prior to Pre-boring. After positioning the rail to correct alignment/gage, pre-bore one hole in each plate. Install insulating thimble, washer and screw spikes in the single pre-bored holes, taking care not to over-torque, causing variances in the track gage and alignment, pre-bore the remaining holes and insulating thimble, washer and screw spikes. Anchor with screw spikes, insulating thimbles and plain washers, as indicated, torqued to 90 foot-pounds.

3.04 HANDLING MATERIAL

A. Care shall be exercised in unloading and handling material to prevent breaing, gouging, bending or otherwise damaging material. Materials shall not be dropped nor thrown, but shall be lifted or skidded to the ground or other surface.

3.05 TOLERANCES

A. Construct within the specified track and special trackwork tolerances specified herein.

3.06 TIE INSTALLATION

A. Install Ties of the proper length. Field cutting of ties is not permitted and such ties shall be rejected.

B. Ties shall not be repetitively respiked. Ties requiring respiking more than one time shall be replaced at no additional cost to the District. All replacements shall meet all requirements specified herein.

C. Respiked ties shall first be retreated with preservatives, then the holes solidly plugged with properly shaped and treated plugs. Pre-boring of subsequent holes is required.

END OF SECTION